# POLYPHASE FILTER WITH STACK SHIFT CAPABILITY

## ABSTRACT OF THE DISCLOSURE

A discrete Fourier transform (DFT) filter bank with stack shift capability, configured, for example, as an analyzer, but equally applicable to a synthesizer, and implemented as a polyphase filter. The DFT filter bank includes a complex modulator for multiplying the input signals $x_0(m)$, $x_1(m)...x_{M-1}(m)$ by a complex modulator $e^{-2\pi k_o}(m)$. In order to keep the coefficients for the polyphase filter real, the coefficients are modulated by a DFT twiddle factor $e^{-2\pi k_o \rho/M}$. The use of the DFT twiddle factor enables the hardware to be reduced significantly. For example, for an 8 phase 203 tap filter, only 8 selectable negators are required as opposed to 211 for known DFT filter banks.